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Via ECFS Filing Only

Ms. Marlene H. Dortch, Secretary  
Federal Communications Commission  
445-12th Street, S.W.  
Room TW-A325  
Washington, D.C. 20554

Re: Report of Oral Ex Parte Presentation of Robert Bosch LLC;  
ET Docket No. 18-122, *Expanding Flexible Use of the 3.7 to  
4.2 GHz Band*; and GN Docket No. 17-183, *Expanding Flexible  
Use in Mid-Band Spectrum Between 3.7 and 24 GHz*.

Greetings:

This notice of oral *ex parte* presentation is submitted pursuant to Section 1.1206(b)(2) of the Commission's Rules. On Tuesday February 19, 2019, Mr. Brian Laughlin of Robert Bosch LLC (Bosch), and the undersigned, communications counsel for Bosch in the above-captioned proceedings, met with the following members of the Commission's staff at the Commission offices in Washington, D.C. with respect to the above-referenced open Docket proceedings:

Erin McGrath, Office of Commissioner O'Rielly  
Will Adams, Office of Commissioner Carr  
William Davenport, Office of Commissioner Starks

Additionally, today, February 22, 2019, Mr. Laughlin and undersigned counsel met with Umair Javed of the Office of Commissioner Rosenworcel on the same subject.

The discussion about the captioned docket proceedings made on behalf of Bosch at each meeting is summarized in the attached memo, copies of which were left with each staff member.

Respectfully submitted,



Christopher D. Imlay  
Counsel for Robert Bosch, LLC

## THE CASE FOR PRIVATE, LOCAL 5G NETWORKS IN THE BAND 3700-4200 MHz IN SUPPORT OF INDUSTRY 4.0

► 5G implementation worldwide is proceeding at a rapid pace. One reason for this is the benefit of 5G technology immediately available in numerous industry sectors (referred to as “5G verticals”: markets in which goods and services are provided that are specific to an industry, trade, profession, or other group of customers with specialized needs).

► 5G is being integrated into industrial communications to contribute towards global digital transformation, and the leading adopters are vertical sectors such as transportation, media, and manufacturing.

► “Industry 4.0” is the digital transformation of industrial markets with smart manufacturing currently on the forefront. It is also referred to as the “fourth industrial revolution” in discrete and process manufacturing, logistics and supply chain, the chemical industry, energy, intelligent transportation, utilities, oil and gas, mining and metals and other segments, resources industries, healthcare, pharmaceuticals and even smart cities. It is dependent on (1) the availability of 5G technology; (2) adequate mid-band spectrum; and (3) the implementation of a reliable communication layer capable of dealing with an increase of several orders of magnitude the number of assets, volume, variety of information and reaction times in manufacturing systems.

► To compare factories of the past with near-future factories enhanced with 5G connectivity, those of the past are static and of necessity were optimized for one particular product. Those of the future are flexible and offer almost unlimited optimization. In Industry 4.0 factories, the only fixed components are the floor, walls and ceiling. They have ubiquitous, wireless connectivity for plug-and-play and mobility, and 5G is the “central nervous system” for the entire factory. It will connect rotating and moving parts; it includes mobile devices; it permits easy retrofitting; higher flexibility and versatility; leveraging of cloud computing; lower maintenance costs; decreased outages; and it will permit built-in localization support.

► Local deployment by the private sector would be a key component to the rollout of 5G in support of Industry 4.0 initiatives in manufacturing and industrial applications. As is the case with today’s Wi-Fi hotspots, the manufacturing industry *must be able to manage its own individual 5G local networks* without those networks being under the control of commercial mobile broadband service providers. Among the reasons for this are liability issues, intellectual property protection, and security. It is critical for 5G technology to be available to the entity involved in production and integrated locally in support of new and future manufacturing and industrial applications, 5G Verticals and Industry 4.0.

► Bosch has active manufacturing operations at sites around the country, many of which would benefit from the deployment of individual 5G local networks. Facilities located in rural areas offer geographic separation from incumbent users of the band, thus limiting interference potential.

- ▶ The European Commission has identified the band 3.4-3.8 GHz as a pioneer band for 5G networks in Europe. Bosch endorses the Commission's proposal to make the 3.7-4.2 GHz band available for flexible use, including manufacturing, in the United States. This would permit at least partial harmonization in the mid-band 5G rollout as between Europe and the United States in the segment 3.7-3.8 GHz.
- ▶ Some Industry 4.0 applications of 5G can be facilitated using commercial mobile 5G broadband from service providers. However, some cannot. Manufacturers require the flexibility to select the best option – commercial mobile broadband versus private local networks - according to their use-cases and individual needs.
- ▶ Private Local 5G Networks will enable American manufacturers to implement revolutionary innovations in industrial manufacturing and to compete effectively in a worldwide market. Therefore, we ask the Commission to reserve at least a portion of the band (specifically the 3.7-3.8 GHz segment) for smaller geographic area deployments on an interference-free basis, premised on a prior coordination notice procedure relative to incumbents (as is done now for certain fixed microwave facilities under Part 101 rules), and to allow private, local 5G networks to be developed compatibly and quickly within communities or factories or otherwise at the local level.